

REMARKS/ARGUMENTS

Reconsideration of the application as amended and in view of the following remarks is respectfully requested.

Status of Claims

Claims 1, 2 and 4-24 are pending in the application, with claims 1 and 23 being the only independent claims. Claims 1, 2, 4, 5, 7, 8, 11, 12, 14 and 15 have been amended. Claim 1 now corresponds to claim 3, written in independent form. Claim 3 has been canceled, without prejudice. Claims 21-24 have been added. Claim 23 corresponds to original claim 9, written in independent form.

Overview of the Office Action

Claims 1, 2, 4-12, 15, 19 and 20 stand rejected under 35 U.S.C. §102(b) as anticipated by WO 01/59895 (*Paschotta*).

Claims 3, 13, 14 and 16-18 stand rejected under 35 U.S.C. §103(a) as unpatentable over *Paschotta*.

Summary of Subject Matter Disclosed in the Specification

The following descriptive details are based on the specification. They are provided only for the convenience of the Examiner as part of the discussion presented herein, and are not intended to argue limitations which are unclaimed.

The specification discloses a laser device for generating laser pulses with an optically pumped semiconductor laser (1). The laser device has an external resonator, at least one mode-

locker (10), and an internal pump radiation source (3a, 3b) which is monolithically integrated with, and optically pumps, the semiconductor laser (1). See, e.g., Fig. 2; paragraphs [0019] and [0055] to [0058] of the specification.

Arguments

Independent Claim 1

Applicants respectfully submit that amended claim 1 (corresponding to original claim 3) is patentable over *Paschotta* because there is no suggestion or motivation to modify *Paschotta* in the way proposed in the Office Action. With regard to original claim 3, the Examiner contends that

"It has been held that omission of an element in a combination where the remaining elements perform the same functions as before [requires] only routine skill in the art, in this case the semiconductor laser is excited by the electrodes (25) to excite output from the active layer, instead of pumping the external pump source ..."

However, there is no suggestion or motivation in *Paschotta* to monolithically integrate a pump radiation source with a semiconductor laser.

Paschotta relates to a passively mode-locked optically pumped semiconductor vertical-extend-cavity surface-emitting laser. See Fig. 1; Abstract of *Paschotta*. *Paschotta* does not use a monolithically integrated pump radiation source to optically pump the semiconductor laser. Rather, *Paschotta* uses an external pump radiation source (7) to optically pump the laser (see Fig. 1; Abstract of *Paschotta*). This is because *Paschotta* explicitly recognizes that an electrical pump source in an electrically pumped vertical-cavity surface-emitting laser (VCSEL) has the

disadvantages that the heat dissipation in a small-area VCSEL limits the driving current, while in a large-area VCSEL the pump distribution is not uniform (see page 2, lines 13-17 of *Paschotta*).

A heat dissipation problem also exists with respect to an optical pump source, as the bandgap and, thus, the wavelength is modified by heat dissipation. Therefore, there is no suggestion or motivation in *Paschotta* to monolithically integrate a pump radiation source with a semiconductor laser. To the contrary, *Paschotta* teaches away from such an arrangement by its explicit recognition of the heat dissipation problem.

The mere fact that something can be done is an insufficient basis to obviate an invention. Absent a motivation, the reference can be revised in the way proposed in the Office Action only with impermissible hindsight based on the present claimed invention.

In view of the foregoing, withdrawal of the §103(a) rejection of claim 1 is respectfully requested.

Dependent Claims 2 and 4-22

Each of claims 2 and 4-22 depends, directly or indirectly, from independent claim 1, and as such benefits from its allowability.

In addition, these claims include additional limitations which serve to even more clearly distinguish the claimed invention over the prior art of record.

Independent Claim 23 and Dependent Claim 24

Applicants respectfully submit that claim 23 (corresponding to original claim 9) is not anticipated by *Paschotta* because *Paschotta* does not disclose, either expressly or inherently,

each and every element as set forth in claim 23. In particular, *Paschotta* does not teach or suggest a device for phase compensation, as recited in claim 23.

Original claim 9 was rejected as anticipated by *Paschotta* under 35 USC 102(b). The Examiner contends that page 3, lines 10-20 and page 9, lines 1-3 of *Paschotta* disclose a device for phase compensation. The Examiner's interpretation, however, is incorrect.

Page 3, lines 10-20 of *Paschotta* teach the advantages of passive mode-locking in comparison to active mode-locking. Since a passive shutter is fast enough, ultra short pulses can be shaped and stabilized. Page 3, lines 10-20 of *Paschotta* also teach that passive mode-locking can be achieved by a saturable absorber mechanism. *Paschotta* later teaches a semiconductor saturable absorber structure for passive mode-locking (see, e.g., page 5, lines 10-25 of *Paschotta*). Thus, this portion of *Paschotta* explicitly teaches using a saturable absorber mechanism to shape and stabilize ultra short pulses. *Paschotta* does not teach or suggest using another element to fulfill these functions or to compensate for group velocity dispersion.

Page 9, lines 1-3 of *Paschotta*, on the other hand, discuss the possibility of harmonic mode-locking, wherein several pulses instead of a single pulse can be circulated with a fixed spacing by, for example, adding a suitable spectral filter in the laser cavity (see page 8, line 25 to page 9, line 4 of *Paschotta*). The spectral filter regulates transmission depending on wavelength. In other words, the spectral filter changes the spectral distribution of a wave package. Therefore, this portion of *Paschotta* does not teach or suggest a device compensating for group velocity dispersion either.

In contrast, claim 23 of the present application specifically recites a device for phase compensation. In the specification, the wording "phase compensation" refers to phase compensation that is caused by group velocity dispersion, and the device for phase compensation

compensates for different phase velocities of spectral fractions of a wave package, thus reducing group velocity dispersion (see, e.g., paragraphs [0030] and [0076] to [0078] of the specification).

In view of these differences, applicants respectfully submit that claim 23, and claim 24, which depends from claim 23, are not anticipated nor rendered obvious by *Paschotta*.

Conclusion

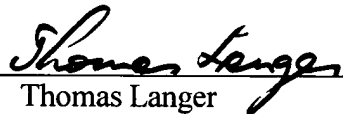
Based on all of the above, it is respectfully submitted that the present application is now in proper condition for allowance. Prompt and favorable action to this effect and early passing of this application to issue are respectfully solicited.

Should the Examiner have any comments, questions, suggestions or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

Respectfully submitted,

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